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MIOFI in Extremely Premature neonates
by **Dr. Lisieux Eyer de Jesus**

Perianal Abscess in Infants
by **Dr. Anas Shikha**

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Pediatric Surgery in Tropics

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What Do We Publish?

We publish all types of scientific manuscripts that are useful to practicing pediatric surgeons. The following topics are generally suitable for PST:

1. Pediatric surgical conditions peculiar to tropical countries or warm humid climate
2. Any pediatric surgical condition treated in tropical centers with advanced facilities
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4. Any article that is potentially useful to practicing pediatric surgeons in tropical or resource poor settings
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Editorial

Boot Camps to Prepare Trainees for a Surgical Residency

Vivek Gharpure

Editor-in-Chief, Pediatric Surgery in Tropics

These days, those who aspire to become a surgeon have to solve 200 multiple-choice questions in 3 hours which makes them eligible to join a residency program. Those who are unable to score well, but are keen to obtain a postgraduate degree in surgery join a private medical college after pay a hefty fees. We are not concerned with the money part, as this is something decided by the governments and medical councils. However, after working with trainees in government, private, semi-private training institutions, I have observed that a large number of trainees are absolutely unprepared to become a surgeon.

A surgeon needs many skills in addition to being a doctor, knowing facts about the human body and performing surgical operations. Remembering the figures of fluid-balance and dosages of antibiotics is good, but that is not enough to become a success ful surgeon. So what are the qualities does a surgeon require? Trainees ought to have them. If not, they need to be taught formally. The current emphasis on research methodology programs can be switched to development of basic skills.

A surgeon must have good physical health as surgical work is mainly physical. Surgeons have to stand up for hours and perform delicate manual work. They must have strong knees, core strength, manual dexterity and good eyesight with hand-eye coordination. This is almost similar to the skill set requirement of airline pilots who undergo a pilot-aptitude battery test. However, we have not heard of a surgical aptitude battery test. Attitude and aptitude (hand-eye coordination, stress handling, memory recall, communication skills, ability to organize facts and make a summary) should be tested in surgical trainees.

Surgeons also need to handle stress. They may have to operate at any hour of the day. These days, surgeons need to handle stressful confrontations with patients, relatives, other doctors in hospital, and yet need to remain cool and composed.

Surgeons have to remember a large number of facts and figures pertinent to patient care. From simple figures such as the patient weight to more complex ventilator settings, innumerable details have to be remembered. If someone is not good at this, proper training can impart it.

Training and practice is also required to summarize complex details such as the history of illness, hospital course and operative findings. Important and relevant facts must be chosen and compiled in a lucid report for communicating. The summary should resemble a short story covering all essential points making a right impression in the minds of readers or listeners.

Even, voice training is desirable, as surgeons have to speak clearly and authoritatively in the operation room (OR), without leaving any ambiguity in the minds of OR nurses, technicians or anesthesiologists.

A complex operative procedure involves a large number of steps which must be performed in the right sequence. A strong memory is very useful in remembering the steps, or else, one must learn to use memory-aids such as teleprompters.

Surgeons must have the ability to nap at will, something similar to that of the special task-force commandos. Surgeons must have the ability to take a quick meal and learn to choose foods which provide the best combination of carbohydrates and proteins to sustain them throughout the day. Besides all this, surgeons must learn to relax, take breaks, pace themselves so that they can continue to work efficiently for hours together.

Several institutions have incorporated boot camps in surgical training and have observed significant improvement in the quality of work.(1) Surgical boot camps are also found to improve the student-satisfaction and confidence in the core competencies of clinical practice.(2,3) Zhang recommended that, medical schools the world over should continue to seek ways to bridge the gaps between pre-clinical, clinical and internship training.(2)

In the current model of training, all emphasis is on rote learning and only a very little emphasis is on actual acquisition of surgical work skills. Though, with skill based learning, this lacuna may be filled, large number of undergraduate students makes this practically difficult. Institutional archi-tecture, work environments, geographic variations and cultural differ across the hospitals make it difficult to design a national level boot camp or even a state level boot camp. Hence, these will have to be designed and implemented at local level, by hospital administrations and the training departments. It is hoped that such a training will lead to a better quality of trainee who can focus on important aspects of becoming a surgeon.

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Invited Editorial

Soft Skills and Surgical Trainees

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Surgical trainees are often burdened with acquiring 'hard' skills such as suturing a wound, draining an abscess, placing a central line, and so on. The other personality traits, such as communication, troubleshooting, timekeeping, team management, critical thinking, and professionalism - together called 'soft-skills' - mandatory for effectual work output, get sidelined.

Soft-skills are innate and precede hard cognitive skills. They should be learned early to survive and succeed in personal, professional and social life. They contribute to 75% of long-term success, while only 25% is due to technical skills. Crucial soft skills are specialty-specific, linked to patient outcomes, engaging multidisciplinary teams, and improving job satisfaction in the demanding field of medicine.

SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis is a fundamental require-ment to begin the process of soft-skill development. This includes learning, absorbing, delivering and disseminating these skills.[1] Non-Technical Skills for Surgeons (NOTSS), a comprehensive taxonomy of soft skills incorporated into training, improves patient outcomes and team performance. These include:

Situation awareness: Keeping an open eye for things likely to turn unexpected during a procedure or surveillance.

Decision making: Exercising sound judgment in arriving at a crucial decision after weighing the pros and cons.

Communication and Teamwork: Ensuring effective information exchange and adopting the role of a team player

Leadership: Supporting, inspiring and encouraging the surgical team for optimal performance.

Non-technical skills are critical to patient safety and outcomes. Many underlying causes of errors are behavioral, such as lack of leadership and failure of communication (40%), rather than technical mistakes. They may lead to sentinel events like retained surgical instruments and wrong-site or wrong-procedure incidents.

Soft-skills can be nurtured by individual attention, counseling and effective feedback. Strategies such as simulations can inculcate adaptability, creativity, critical thinking and conflict resolution.[2] Poor communication and high level of stress can impair performance in novice surgeons. Decision-making, leadership, and teamwork are critical to good surgical outcomes, especially in preventing errors and complications. Teamwork reduces stress by improving coordination.

The most important component of soft skills is emotional intelligence (EI), as it underpins many

other skills. EI improves intraoperative decision-making and reduces complications. On the other hand, poor decision-making under pressure and lack of collaboration lead to increased errors in the operating room (OR). EI enables individuals to understand and manage their own emotions while recognizing and influencing emotions of others. This is important for effective interpersonal interactions. The concerns and emotions of patients and their families need to be understood and addressed in the context of empathy.[3]

In team-based training sessions, surgeons should practice non-technical skills along with technical skills in a simulated OR environment. Scenarios such as intraoperative crises will help in assessing the degree of collaboration, leadership, communication, and decision-making. Senior surgeons or mentors shall provide feedback and coaching to improve the soft skills of junior surgeons. Dedicated sessions of feedback at individual level happening at regular intervals provide a solid foundation for honing the soft skills in surgical training.[2]

Effective communication is essential when dealing with young, culturally diverse patients and their families. Clear explanations, active listening and empathy will build trust and facilitate decision-making. Time management is essential in handling the demands of clinical care, documentation, and communication while ensuring high-quality care and a strong ability to work in multidisciplinary teams.

Implementing soft-skills instruction in low-, middle- income countries (LMIC) is challenging due to geographical distances, cultural differences, language barriers, and scarcity of regional subject matter experts. However, improvements in access to technology and the increasing quality of free, open-access medical education have shown that MOOC (Massive Open Online Courses) are a cost-effective and scalable way to provide surgeons with soft skills training.

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Clinical Audit

Meconium Ileal Obstruction and Functional Immaturity of the Intestine (MIOFI) in Extremely Premature neonates: A Case Series

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Keywords
Acute abdomen
Intestinal obstruction
Meconium disorders
Neonatal emergency
Premature newborn

Abbreviations
ELBW - Extremely low birth weight
MI - Meconium ileus
MIOFI - Meconium ileal obstruction with functional immaturity of the intestine
NEC - Necrotizing enterocolitis
NICU - Neonatal intensive care unit
SGA - Small for gestational age
VLBW - Very low birth weight

Abstract

Introduction: *Thick meconium induced ileal obstruction due to functional immaturity of the intestine (MIOFI) is a rare and frequently unrecognized condition that is typically seen in extremely low birth-weight (ELBW) and low birth-weight (LBW) premature babies. Its prognosis depends on early recognition and treatment. This retrospective study was performed to analyze the spectrum of babies with MIOFI and their outcome.*

Methods: *A retrospective review of neonates presenting to two referral hospitals with MIOFI during the first semester of 2024 was performed.*

Results: *During the study period 3 neonates presented with MIOFI. All of them were product of complicated pregnancies. Two of them were of ELBW. All the babies passed minimal amount of meconium prior to the onset of MIOFI symptoms. Two of them had severe abdominal distension without air-fluid levels and 1 presented with gasless abdomen. Only one was operated upon, with a mistaken clinical diagnosis of long-segment aganglionic megacolon; the other two were treated conservatively. All the 3 babies showed normal intestinal function during follow-up.*

Conclusions: *MIOFI presents as neonatal intestinal obstruction affecting the distal ileum. Diffuse abdominal distention and respiratory distress are common symptoms. MIOFI responds well to water-soluble contrast enemas, with elimination of meconium plugs and mucus, followed by normalization of intestinal transit.*

INTRODUCTION

Thick meconium induced ileal obstruction due to functional immaturity of intestine (MIOFI) was first described in 1965.[1] The disease is rare with an incidence of 1-2 patients per 1,000,000 live-births[2] and it is typically seen in extremely low-

(ELBW) and very low- birth-weight (VLBW) premature babies. The condition has also been rarely described in term neonates.[3-4] Although MIOFI is not well known and is rarely considered in the differential diagnosis, its prevalence is increasing due to improved survival of extremely premature babies in recent years.[5] The reported prevalence of MIOFI in ELBW premature babies varies from 3.9 to 17%.[6,7]

Lack of familiarity with the entity among clinicians is the first barrier of early diagnosis and prompt management.[8] A correct diagnosis is essential for improved outcome and avoidance of unnecessary surgical intervention and its associated morbidity. In this communication we report a small cohort of MIOFI to create clinical awareness.

METHODS

Retrospective review of all neonates presenting with MIOFI during the first half of 2024 at two referral hospitals for high-risk pregnancy and surgical care of neonates in Rio de Janeiro, Brazil was performed. Parental consent to use clinical data was obtained.

RESULTS

A total of 3 neonates presented with MIOFI during the study period. Their clinical details are summarized in Table 1. Two of them were ELBW premature babies. Prior to the onset of MIOFI symptoms, all of them had delayed elimination of meconium, either after anal stimulation (n=2) or spontaneously (n=1). Abdominal distension was severe in all the neonates, and it caused respiratory distress in 2 of them. (Fig. 1) Plain radiographs of two neonates showed diffuse gaseous distension of abdomen without air-fluid levels (Fig. 2), while one presented with gasless abdomen (case 2).

Only one patient (case 3) was operated on day-26 with a mistaken clinical diagnosis of long-segment aganglionic megacolon. Intraoperatively the surgeon noted micro-colon and a transition zone 5 cm proximal to ileocecal junction. Viscid meconium in the distal ileus was difficult to be milked distally. Ileostomy 10 cm proximal to the ileocecal valve and colonic biopsy were done. Persistent abdominal distension necessitated a re-operation after 6 days. He passed meconium after retrograde contrast enema through the ostomy.

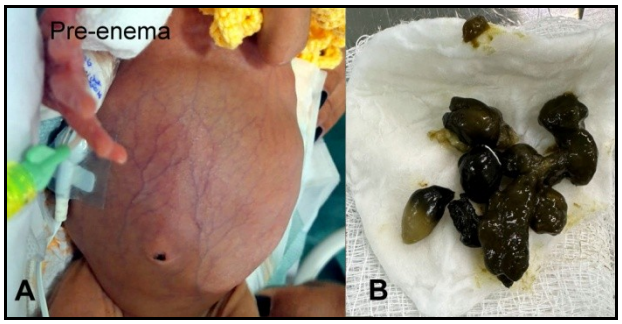

Fig 1. *Clinical features of MIOFI. (A) Severe abdominal distension (B) Thick meconium eliminated after enema (Patient 2)*

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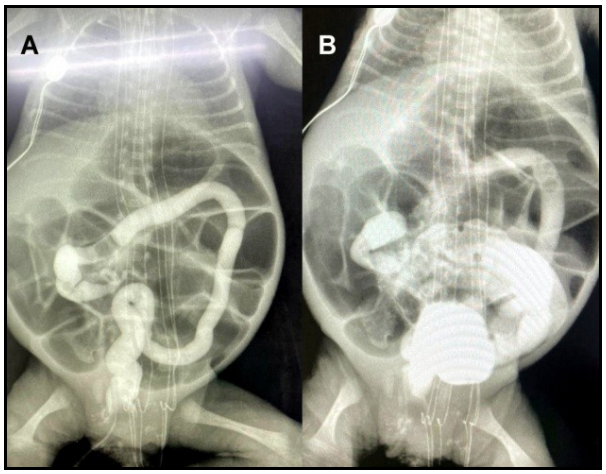

Fig 2. *Radiographs in MIOFI showing severe intestinal distention without air-fluid levels. (A) Gastrografin™ enema showing microcolon, (B) Contrast refluxes into the ileum proximal to the obstruction (Patient 1)*

The other two patients were treated conservatively as non-perforated MIOFI. Patient 1 was relieved after achieving ileal reflux of contrast through a retrograde enema (Fig. 2) and patient 2 resolved after administering high-volume saline enema.

Table 1. Clinical features of neonates with MIOFI

Clinical features	Case 1 §	Case 2	Case 3
Sex of newborn	Male	Male	Male
Birth weight (g)	770	895	1765
Gestational age at birth (weeks)	29	26	33
Mode of Delivery	Cesarean (emergency)	Vaginal	Cesarean (emergency)
Maternal co-morbidity	hypertension, syphilis	Premature amniorrhexis with infection, syphilis.	Hypertension
Onset of obstructive symptoms	Day 10 of life	From birth	Day 5 of life
Symptoms	AD, FI, RD, no sepsis	Severe AD	FI, no sepsis, worsened AD on day 26, RD
Age at first elimination of meconium	Day 5 of life by anal stimulation	Day 5 of life by enema	72 hr of life, Spontaneous
Plain Radiographs	Diffuse gaseous distension	Gasless abdomen	Diffuse gaseous distension
Treatment	Gastrografin™ enema twice	Saline enema	Harmann-type terminal ileostomy + colon biopsies
Colonic biopsy	Not done	Not done	Ganglion cells present
Outcome	Passed meconium.	Passed meconium on day 23	Non-functional ileostomy needed contrast enema.
Complications	Intestinal hemorrhage* and shock*.	Barotrauma†, Pneumoperitoneum†(on day 7 treated with flank drain), Operative liver laceration, Endocarditis*, Superior vena cava thrombosis*	None
Follow up	Died on day 29 of life.	Died on day 45 of life	Awaiting ileostomy closure.

** Complications following MIOFI; † Complications before the onset of MIOFI. § - Cystic fibrosis excluded by genetic test. AD - Abdominal distension, FI - Feed intolerance, MIOFI - Meconium ileal obstruction with functional immaturity of the intestine, RD - Respiratory distress*

All the three neonates had normal intestinal function after the elimination of huge volume of extremely thick meconium. Only one patient survived and is waiting to have his ileostomy closed. Two other neonates died 6 and 22 days respectively after the resolution of MIOFI; they died of unrelated causes such as intestinal hemorrhage, catheter sepsis, endocarditis associated to superior vena cava thrombosis.

DISCUSSION

The literature about MIOFI is scarce and the entity is not well known to pediatricians and pediatric surgeons.[9] In the literature, MIOFI is known by several synonyms. (Table 2) This variable nomenclature hampers research and accentuates difficulties in differential diagnosis, possibly leading to late or misdiagnosis and delayed treatment.

Intestinal function matures in the last trimester of pregnancy. Immature neural ganglia that predominate the enteric nervous system till 24 weeks of gestation gradually matures.[10] Intestinal peristalsis is typically disorganized between 25-30 weeks of gestation, generating inefficient propulsion.[5] Hence, delayed elimination of meconium is not uncommon in ELBW preemies.[5-6]

Table 2. Synonyms of MIOFI

Names stressing its resemblance to meconium ileus*
• Meconium ileus equivalent
• Meconium ileus without cystic fibrosis
Names emphasizing its high incidence in preemies
• Meconium obstruction of prematurity
• Neonatal transitory ileus
Names emphasizing the abnormal nature of meconium
• Meconium disease
• Thick meconium syndrome
• Meconium-related ileus
Names emphasizing the immaturity of intestine
• Micro-colon of prematurity
• Neonatal functional intestinal obstruction

** Classical meconium ileus occurring in cystic fibrosis*
MIOFI - Meconium ileal obstruction with functional immaturity of the intestine.

MIOFI presents as acquired distal ileal obstruction with diffuse abdominal distention which may be complicated by respiratory distress.[11,12] Prenatal intestinal abnormalities are usually absent. Prior to the onset of MIOFI, most of the neonates pass small amount of meconium, either spontaneously or after enema.[5,13] Term neonates present earlier, while ELBW and preterm babies become symptomatic during the second week of life.[11,13] Typical cases do not present with sepsis or peritonitis. They show a relatively good clinical condition, except after perforation.

Air-fluid levels are absent in plain radiographs.[8] Absence of rectal air shadow may raise a suspicion of aganglionic megacolon.[11,14] Rarely, a gasless abdomen is seen as it was in our case-2.[15-16]. Pneumoperitoneum may occur with perforation. In premature neonates presenting with typical clinical features an empirical diagnosis of MIOFI should be assumed.

Colonographically or intraoperatively a change in the caliber of the distal ileum (10 - 30 cm proximal to the ileocecal valve), resembling the transition zone of a *total colonic aganglionosis*, may be seen. Multiple filling defects (meconium plugs) are seen distal to the obstruction. Long thick meconium moulds seen within the obstructed bowel are difficult to manipulate or milk down digitally. The colon may either be normal or be a microcolon.[9]

Histologically, neural ganglion cells are present in the entire bowel, as demonstrated in the case-3 of our series. Ganglion cells of MIOFI are typically immature, a fact that differentiates it from typical aganglionic megacolon.[2,10]

Most patients respond to water soluble contrast enema treatment with diatrizoate meglumine and diatrizoate sodium solution-USP (Gastrografin™, Bracco Diagnostics, Italy). It was adapted from the cystic fibrosis treatment described by Noblett[17] in 1969. Hyperosmolar contrast dissolves viscid meconium facilitating its passage whereupon the intestinal transit becomes normalized. Technical details of enema such as the frequency of administration, volume of enema fluid and ratio of dilution are variously proposed by different authors.[6,19-20] Gastrografin™ dilution of 1:5 to 1:4 is commonly used. The total irrigation fluid per enema ranges from 10-15 ml/kg to 20 ml/kg. Retrograde infusion of contrast solution may be done by passive irrigation under gravity, pressure controlled ($\leq$ 50 cmH_2O)[13] or flow controlled (1 ml/s).[6,22] Irrigation may be done with or without rectal occlusion with a balloon catheter[17-20] and it may be given once[6,16,19] or twice[18,22] daily. Administration of enema under real-time fluoroscopy monitoring is not essential.[18] Most of the clinicians avoid risky transportation of sick babies to a radiology suite and they prefer bedside 'blind' infusion in the neo-

natal intense care unit controlled with post-infusion imaging[6,13,19,22] or real-time ultrasound.[20] Timing of enema administration is also not well defined. But it seems logical, to administer enema treatment if a newborn with distended abdomen did not pass meconium within the first 48 hr of birth. Most of the authors[12-13,19,21,22] agree that contrast refluxing into the ileum is essential for satisfactory therapeutic response. Criteria of diagnosing inadequate response to enemas and surgical indications are mostly subjective, with the exception of perforation complicating the treatment. Enemas are generally safe, and only 3 perforations associated with them are described in the literature.[7-9] One of the perforations occurred 8 hours after the procedure.[9] Enema is relatively contraindicated in hemodynamically unstable neo nates, due to the risk of osmotic dehydration.

Most neonatal surgeons opt for intra-operative lavage (including transappendicular irrigation) or milking of inspissated meconium with or without decompressing ileostomy. Simple abdominal drain is not sufficient to treat perforations; rather the intrinsic obstruction should to be addressed.[8,13] With successful treatment, reasonably good survival with normal gut function has been reported.

The close differential diagnosis of MIOFI includes meconium ileus secondary to cystic fibrosis, meconium plug syndrome, long segment colonic aganglionosis and ileal atresia. Complications are mostly due to delayed diagnosis or treatment. The possibility of necrotizing enterocolitis (NEC) is to be considered in the differentials as it is much more common in premature neonates. MIOFI presents without peritonitis or sepsis, and the typical radiological signs of NEC such as the pneumatosis intestinalis will be absent. Spontaneous intestinal perforation is another important differential; but they do not present with prolonged or severe abdominal distension before the onset of perforation. Hirschsprung disease is uncommon in preterm babies and it can be excluded by demonstrating ganglion cells in the colonic biopsy.

CONCLUSION

Although MIOFI is an uncommon disease, its incidence is on the rise due to improved survival of extremely premature neonates. Prompt early diagnosis of MIOFI is essential for good outcome after conservative treatment. Long segment aganglionosis is a potential differential diagnosis of MIOFI.

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Clinical Study

Limited Incision-and-Drainage versus Conservative Management of Perianal Abscess in Infants

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Keywords
Anal pathology
Fistula-in-ano
Perianal abscess
Perineal abscess
Multi-drug resistant bacteria
Non-operative treatment
Surgical drainage of pus

Abbreviations
CI - Confidence intervals
CM - Conservative management
ID - Incision and drainage
LID - Limited ID
MDR - Multi-drug resistance
OR - Odds ratio
PA - Perianal abscess

Abstract

Introduction: *Perianal abscesses (PA) are common in infants, yet there is no consensus on optimal management. Approaches range from conservative management (CM) to surgical incision and drainage, with varying rates of recurrence and fistula formation. A significant challenge is the absence of both standardized definitions and a protocol driven approach to incision-and-drainage. This study aims to evaluate the outcomes of standardized limited incision-and-drainage (LID) and CM approaches in infantile perianal abscesses.*

Methods: *This retrospective observational cohort study included infants less than 18 months of age who were treated for perianal abscess at a single pediatric surgical unit between August 2019 and August 2023. Patients who had been treated either with LID or CM protocols were compared. The primary outcomes were recurrence and fistula rates, while secondary outcomes included identifying potential risk factors for these complications.*

Results: *A total of 61 abscesses in 51 infants were analyzed. No significant differences were found between LID and CM groups in terms of recurrence (33% vs. 29%, p=0.94) or fistula formation (30% vs. 25%, p=0.64). Bacterial cultures revealed antibiotic-resistant bacteria in 36% of cases, with resistant strains significantly associated with both recurrence (OR 9.28, p=0.0006) and fistula development (OR 5.00, p=0.010).*

Conclusions: *LID and CM protocols yield comparable outcomes in terms of recurrence and fistula formation in infants with PA. The strong association between antibiotic-resistant bacteria and these complications underscores the importance of early identification and targeted antimicrobial treatment. Further research is needed to refine antibiotic use and assess long-term outcomes.*

INTRODUCTION

Perianal abscess (PA) is localized collection of pus that commonly arises from infection within abnormally deep anal crypts of Morgagni. It is particularly common in infants and young children less than 12 months of age.[1-4] They typically present as tender, fluctuant masses in the perianal region, often at the 3 o'clock and 9 o'clock positions. A perianal fistula results when an abscess ruptures, forming a tract connecting the infected anal crypt to the skin surface. Persistent mucous and/or fecal discharge may occur through the fistula.[1-3]

The optimal management of PA remains a subject of debate. It includes topical therapy, systemic antibiotics and conservative management (CM), incision-and-drainage (ID) or a composite approache. Reported recurrence rate varies between 12% and 26%, while progression to perineal fistula has been reported in 20% to 85% of cases.[4-7]

Another contentious issue is the progression of PA into perianal fistula, which is reported to occur in 20% to 85% of cases.[4-12] Some studies have suggested that CM is less likely to result in fistula formation, while others have reported reduced fistula rates when ID is combined with antibiotics.[4] However, there are no consensus on the optimal management of PA.[6-12] This may be attributed to the absence of standardized treatment protocols.

This study aims to address these knowledge gaps by comparing the outcomes of a standardized protocol of limited incision-and-drainage (LID) and CM. The primary aim of this study is to compare the risks of recurrence and fistula formation between the limited ID and CM groups. The secondary aim is to identify potential factors that influence fistula formation and recurrent PA.

METHODS

This study presents a retrospective cohort of all infants less than 18 months of age, referred for PA between 1st August 2019 and 31st August 2023. Infants with gluteal abscesses located far away from the perianal creases, or those who had received prior treatment, were excluded. Calculation of statistical power was not feasible due to the retrospective nature of the study and a small sample size.

At the pediatric surgery unit of the Raja Isteri Pengiran Anak Saleha (RIPAS) Hospital, LID and CM approaches to PA had been standardized prior to this study. All the doctors strictly adhered to one of these two protocols, preventing deviations that could introduce bias or compromise data reliability for subsequent audits and analysis. Hospital protocol necessitated only these two approaches to be followed, and prevented any modifications that could skew comparisons.

The LID procedure was performed under aseptic conditions by applying topical anesthetic cream or ethyl chloride spray. The most fluctuant part of the abscess was incised, evacuating pus, obtaining swab samples for microbiology, and applying a compression dressing. No de-septation, packing or other instrumentation were used. Parents were instructed to frequently change diapers, clean the incision site, and apply compression to facilitate further drainage. Oral amoxicillin-clavulanic acid was prescribed for one week. A follow-up was conducted one-week post-procedure and alternate antibiotics were prescribed if microbial cultures reveal resistance to amoxicillin or if induration and purulent discharge continued.

In CM strategy, oral amoxicillin-clavulanic acid was prescribed for one week, with a follow-up appointment scheduled upon completion of the course. In case of spontaneous rupture on presentation, swabs were obtained from the abscess site; for those ruptured at home, swabs were taken during follow-up if residual pus was present.

The use of amoxicillin-clavulanic acid as the initial antibiotic of choice in both the groups was determined by the institution's infection control committee, on the basis of local antibiograms and antibiotic stewardship policies. Weekly follow-ups were continued until all the symptoms resolve. Subsequently, patients were reviewed twice at 3 and 6 months respectively. Pediatric surgical hotline number was provided to parents, facilitat-ing earlier appointments if lesions recurred. A perianal fistula was defined as the continuation of a PA, characterized by an open drainage site discharging mucus or stool daily.

Data collected for analysis include patient age, sex, abscess location, perianal fistula, recurrence, type of bacterial isolate, presence of multi-drug resistant (MDR) bacteria and duration of follow-up. Patients were divided into two groups based on the nature of treatment given: LID versus CM. Data analysis was done using Statistical Package for Social Sciences (SPSS) software (ver. 29). Student t-test was used to compare continuous variables, and chi-square test for categorical para-meters. Statistical significance was set at a P-value of 0.05 or less.

RESULTS

A total of 61 abscesses in 51 infants were included in the study. A male predominance (n=48) was noted. The median age at presentation was 6 months and the mean follow-up was 9 months.

Majority of the abscesses were located at either the 3 o'clock (56%) or 9 o'clock (36%) positions, with the remaining 8% occurring at various other locations (1, 5, 7, and 12 o'clock). There was no statistically significant difference between the 3 and 9 o'clock positions in terms of progression to fistula formation (P=0.91). Notably, none of the three female patients presented with abscesses at the 3 or 9 o'clock positions; two had abscesses at 1 o'clock, and one at 12 o'clock positions.

Among them 33 abscesses (54%) were managed with LID, while the remaining 28 (46%) were treated with CM. Age, sex, abscess site, bacterial isolate, bacterial resistance pattern and follow-up period did not differ significantly between the two groups. (Table 1)

Table 1. Outcome of Perianal Abscess

Variables	LID (n=33)	CM (n=28)	P Value
Age (months)*	6.04 (1-17 m)	5.5 (1-18 m)	0.25
Sex			
Male	31	27	0.20
Female	2	1	
Location of lesion			
3 O'clock	21	13	0.46
9 O'clock	10	12	
Others	2	3	
Bacterial Isolates			
Escherichia coli	13	12	0.25
Klebsiella	13	6	
Mixed flora	6	6	
Not available	1	4	
Drug resistant isolates	9	11	0.86
Recurrence†	11 (33%)	8 (29%)	0.94
Fistula†	10 (30%)	7 (25%)	0.64
Follow-up (months)*	9 (6-16 m)	8 (6-14 m)	0.59

** Values as median (range); † values as numbers (%) CM - Conservative management; LID - Limited incision-and-drainage*

The perianal fistula complicated 30% of patients treated with LID and 25% of those treated with CM. However, this difference was not statistically significant (P=0.64). Similarly, recurrence was observed in 33% of patients treated with LID and in 29% of those treated with CM, with no statistically significant difference between the two groups (P=0.94).

Bacterial cultures isolated *Escherichia coli* in 25 cases (41%), *Klebsiella* species in 19 cases (31%)

and mixed flora in 12 cases (20%). No culture reports were available in 5 cases (8%). Among the isolated bacteria, 20 out of the 56 isolates (36%) exhibited multi-drug resistance. Notably, just over two-thirds of the recurrent cases involved resistant bacteria, a difference that was statistically significant (P=0.007). The odds ratio (OR) of recurrence with resistant bacteria was 9.28 (95% CI: 2.60 to 33.06, P=0.0006). In this context, 10 out of the 17 fistulas (59%) were associated with resistant bacteria, which was statistically significant (P=0.002). The OR for fistula development in the presence of resistant bacteria was 5.00 (95% CI: 1.44 to 17.27, P=0.010).

Recurrence was observed in 19 abscesses (31%), of which 10 (53%) progressed into fistula. (Fig 1) Among the 42 abscesses without recurrence, only 17% had fistula. This was statistically significant (P=0.03), with an odds ratio (OR) of 5.55 (95% CI: 1.65 to 18.67, P=0.005) for fistula formation in recurrent PA. Notably, all the recurrences occurred within the first 3 months of initial presentation, except for one case that recurred after 6 months.

DISCUSSION

Anatomical abnormalities of the anal glands or crypts, combined with infection, are widely held as the key factors in the pathogenesis of (PA) in infants.[1,2] Male predominance in PA is well documented, with some studies reporting exclusively male patients. This may be explained by the influence of androgens on anal glands.[4] In our series, the female-to-male ratio was approximately 1:20. Interestingly, females often presented with lesions in atypical locations (other than the typical 3- and 9- o'clock positions), suggesting the possibility of a different pathogenic mechanism.

The ideal management of PA in infants remains contentious. Although some studies [13,14] advocate CM, it is not universally accepted.[14,15] Lower rates of recurrence and fistula formation with CM have been documented[12,16,17] as compared to that of ID. According to some authors combining ID with sys-temic antibiotics reduces the risk of fistula. [4]

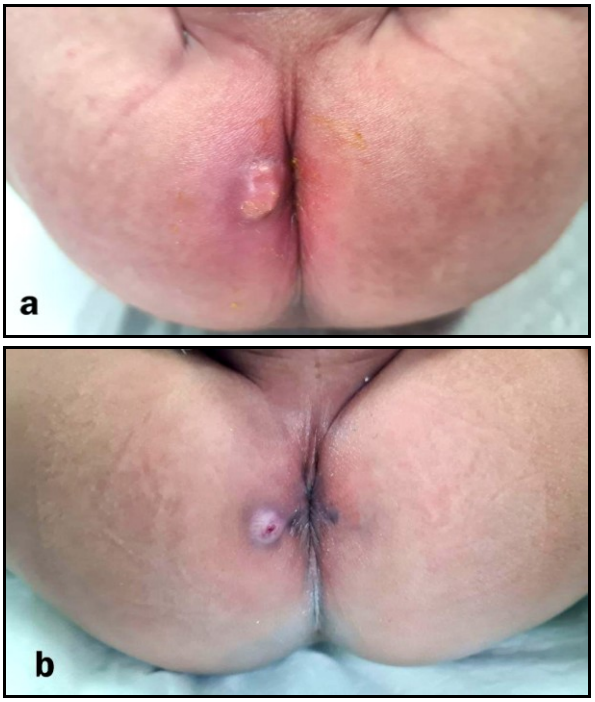

Fig 1. *Perianal abscess at 9' o'clock location. (a) Abscess drained by limited incision; (b) Same patient complicated with fistula.*

The conflicting rates of complications noted in the literature appear to be due to lack of standardized protocols. In contrast to this our hospital protocol is well standardized for both LID and CM, thereby enabling a more precise comparison of outcomes. The well-matched cohort of the two groups in our study strengthens the validity of our findings.

We noticed no significant difference between LID and CM in terms of fistula formation or recurrence rates. This observation disproves the claims of superiority of one method over the other in preventing complications. Absence of clear advantage of any one method of treatment allows greater flexibility in therapeutic decision-making by incorporating patient comfort, resource availability and parental preferences. However, it is important to note that both modalities of treatment were associated with significant rates of fistula (28%)

and recurrence (31%), highlighting the need for further research on more effective prevention.

Our data suggest a strong association between multidrug-resistant bacteria and complications such as abscess recurrence and fistula formation. More than two-thirds of recurrent abscesses were due to antibiotic-resistant bacteria, with the odds of recurrence being over nine times higher in these cases compared to those due to non-resistant bacteria (OR 9.28, 95% CI: 2.60-33.06). Additionally, the presence of resistant bacteria significantly increased the risk of fistula development, with a fivefold increase in odds (OR 5.00, 95% CI: 1.44-17.27). Our data also suggest that abscess recurrence itself is a significant predictor of fistula formation. Recurring abscesses were five times more likely to evolve into fistulas as compared to those that did not recur (OR 5.55, 95% CI: 1.65-18.67). These findings are of predictive value.

The combination of bacterial resistance and lesion recurrence suggests a potential synergism in the fistula formation. These findings underscore the importance of promptly identifying resistant bacteria and implementing targeted anti-microbial therapy to reduce the risk of complications.

LIMITATIONS

This study has several limitations. First, the benefits of upfront antibiotic therapy with amoxicillin-clavulanic acid remain uncertain in cases without resistant bacteria. This underscores the need for further research to determine if antibiotics should be prescribed more selectively based on bacterial resistance patterns.

Second, although efforts were made to standardize treatment protocols, variations in the timing of culture may have influenced the detection of resistant bacteria, potentially introducing bias.

Third, despite standardized protocols controlling confounders, retrospective studies carry inherent selection bias. A double-blinded randomized controlled trial remains the gold standard for validation.

Finally, differences in the pattern of local bacterial flora, antibiotic stewardship practices, and healthcare access may limit the generalizability of our results to other settings.

CONCLUSION

This study compared the outcomes of LID versus CM in infants with PA. Both approaches had comparable rates of recurrence and fistula formation, suggesting that neither strategy is superior in preventing these complications. Isolation of antibiotic-resistant bacteria was strongly associated with more complications, highlighting the need for early identification of pathogenic organism and targeted antimicrobial treatment.

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Tropical Memoirs

Swim or Sink: Kabul Experience of a Pediatric Surgeon

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Keywords
Resource limited setting
Personal experience
History of Pediatric Surgery

Abbreviations
OR - Operating room

Abstract

Afghanistan is a country devastated by militancy and civil wars. Not only the resources are limited but also free movement inside the country is restricted due to security concerns. In such a restricted atmosphere, a freshly graduated pediatric surgeon from India opted to work at the Indira Gandhi Institute of Child Health, Kabul. In this memoir, he narrates his ordeals and triumphs, thereby giving more insight into the status of pediatric surgery in Afghanistan.

I joined the Indira Gandhi Institute of Child Health, Kabul, Afghanistan, (Fig. 1) as an Associate Professor of Surgery on the 19th of October 1985. I was fresh from my M.Ch training and needed the much desired hands-on experience. Initially, I was reluctant to join in view of security concerns in Afghanistan. However, after toiling for quite some time for an institutional placement, I decided to take the plunge. The authorities would have been skeptical in the beginning, because of my lack of experience, but ultimately relented because they had no other choice.

As soon as I completed the joining formalities, I was told that I had an appointment with the Minister of Public Health and would have to leave immediately. At the Minister's office, besides pleasantries, the issue of my being so young and not having experience cropped up. My defense was that our Indian Prime Minister then (Mr. Rajiv Gandhi) was also young. If he can manage a vast country like India, why can I not manage here? The issue appeared to have been resolved.

Fig 1. *A recent photograph of the Indira Gandhi Institute of Child Health, Kabul. The author, during his tenure, was not permitted to take any photograph due to security concerns. Hence, he has no images of the hospital other than his pictorial memory. (Picture source: Public domain image from Wikimedia; unknown author)*

Upon returning to the hospital, I was informed that I was urgently needed in the operating theater (OT). There was no formal orientation or ceremonial welcome, to say the least. In OT I was informed that I had to operate on a child, who was already on the operating table and had been anesthetized. I found that it was a colonic conduit to be implanted into the colon. I realized that it was not an emergency and it appeared to be some form of conspiracy. I could not back out without losing a lot. I was staring at starting my career with a big negative. I decided to take the plunge. My only knowledge about the procedure was from a single article that I reviewed in the journal club during my M.Ch training days. I planned the procedure as I scrubbed for the procedure. Non-availability of blood for transfusion was adding to my challenge. There was no electrocautery and the height of the operation table could not be adjusted. There was a single OT light and it was not very bright. Thankfully, my theoretical knowledge about the procedure served me well and I could easily complete it without any hitch. The child did well post-operatively. However, this incidence enormously boosted my confidence. Since then, I never doubted my capability. In essence, this was my welcome as well as orientation ceremony at an alien place. I was supposed to prove myself and I had no friends or guide. However, I had had the experience of dealing with a hostile workplace earlier.

The hospital I was employed was the only place in Afghanistan, where children could be operated. It had 80 pediatric surgical beds. Local administration was provided by the Afghanistan government while experts and equipments were provided by the Indian government in consultation with the All India Institute of Medical Sciences. There were 8 junior residents (postgraduate trainees), 4 senior residents and 1 faculty member. All of them were several years or decades senior to me. So, I had to prove my worth and establish that I am not a *'bachcha'* (young child).

The biggest challenge was working without an electrocautery. I took up the issue with the local Indian administration. To my dismay, they told me to play safe and do only small cases. I refused to accept this and raised the issue with the highest authority, the Indian ambassador for Afghanistan. He expressed surprise that nobody had previously raised the issue and promised to do his best. But, I realized that it will be a while before help arrives through circuitous route.

It was a challenge to operate major cases without a cautery, notwithstanding my lack of experience. I remembered a gossip from our training days that when a surgeon (a strong proponent of manual pressure to stop any hemorrhage) was challenged to remove a kidney without ligating its pedicle, he was said to have managed to do so using pressure alone. He was then doing a renal transplant. After removing the donor kidney, he was said to have packed the wound, unscrubbed, discussed about weather over a cup of coffee, scrubbed again, and removed the packs. Bleeding by then had reduced to a trickle. He then secured the pedicle and proceeded to complete the procedure. Whether this anecdote was true or fictitious, local pressure was the only option available to me. I resorted to blunt dissections more often than sharp dissections. My index finger covered with a gauze piece became my main dissecting tool. I was reminded of my training days when 'finger surgeons' were considered as 'lousy surgeons'. So be it! At least, they are surgeons providing dome cure!

Non-availability of blood was another major issue. I realized that local people could arrange blood on their own. There was a military hospital nearby that was controlled by the camping Russian Army. They used their own resources and arranged blood at a very short notice also.

To compensate for the non-adjustable OT table, I had to strengthen my back. As far as the OT focus light was concerned, my eyes were then still relati-

vely young and I had to adjust the operating light frequently to focus on the operating field. I also procured a strong torch from the local market and used it when required.

Nursing care after normal working hours was non existent. There was only one nurse for 80 beds. It was inhuman to expect the single nurse to do justice to all the patients. So I adjusted drug administrations, so that there was less-load on the nursing staff. Wherever possible (at least the oral medications), I would entrust drug administration to the attendants of patients.

The first major surgical challenge was a sacrococcygeal teratoma in a small child. Nobody knew the exact age of the child or the duration of the lesion. The tumor weighed 6 kg. The tumor was the size of a football and the child happily sat over it like a stool. It gave me nightmares and I refreshed my knowledge, about the lesion by repeatedly reading my textbooks. I realized that it was mainly extra-pelvic and dissection should not be a problem. I need to be careful only about the rectum. No investigations were available to support my clinical diagnosis and blood transfusion could not be arranged. I planned the procedure and mentally rehearsed the steps of the operation several times. Whenever in doubt, I clarified it from my textbook. I knew that luxury will not be available in the OT. The actual surgery went through well. I separated rectum in the beginning itself using sharp dissection. Rest of the job was done by my index finger in no time. There was very little blood loss and the child did well postoperatively. At the end of the operation, my assistant asked me, “Sir, how many such operations have you done before?” He refused to believe me when I told him that that was my first case.

Local people were still skeptical about my capabilities. Once, there was a hectic call on my door, at the middle of night. When I opened, I found an Indian gentleman standing. After looking at me, he told that he wanted to meet my father. When I told him that my father was in Delhi and if he wants any help, I can do that; he went away. On reaching the hospital next morning, I heard heated conversation going on in the ward. I was informed that a child belonging to an Indian embassy staff, had been admitted with acute appendicitis and the parents were not consenting for surgery. They wanted the child to be managed conservatively for 3 days, so that they take away the child to India for treatment. The earliest flight departing Afghanistan was only after 3 days. I assessed and found the child merits immediate surgery. I gave the parents 3 hours to either give consent for surgery or take the child away. There was huge commotion and the Indian ambassador contacted me and asked as to why I am becoming so difficult? I replied, “Sir, my country has sent me here as a surgeon. If people of my nativity don’t trust me, how can I expect others to trust me? You may please better send me back with that flight in question.” The ambassador yielded to my argument and instructed accordingly. The child had an eventless surgery and postoperative period. By this, people became familiar with my stubbornness as well.

There was another early morning commotion. I met with an angry Russian lady, wife of an Afghan minister. A Russian surgeon told her that the child was going to die. I comforted her and promised her that we can take care of things and requested her to provide more details. She told that she had brought the child to the hospital 3 days back with abdominal pain. The child had been prescribed with some medicines and was sent home. When the child did not improve, a Russian surgeon was consulted. She was told that the child has a burst appendix and was not going to make it. The child in question was a young boy holding her finger and happily enjoyed watching the proceedings. On examining the child, I found he had an appendicular lump. I offered to admit the child and manage. But surgery was not indicated at that stage. “What if the child dies?”, the mother asked. I replied, “You

can get me booked for manslaughter." There was a call from the Indian ambassador: "Doctor! Are you sure? If something untoward happens, there are going to be international consequences." I calmly replied, "When I am in doubt, I will let you know. For now, I have no doubts in my capability". The child was admitted and administered intravenous antibiotics. On evening rounds, I found his parents more relaxed and reassured. After the child was discharged after 3 days, the ambassador rang me up and told that he could not sleep for 3 days. Well, I did not lose my sleep for a single moment at least on this issue. I was not sure whether I had proved myself or not, but I was more relaxed and comfortable.

Son of a local defence minister had to be operated for intestinal obstruction. They had more faith in Russian surgeons. But the child could only be operated at our facility. They wanted me to do the operation under the supervision of a Russian surgeon. I had seen many Russian trained surgeons by then. I thought our ways of working are different and that might cause fresh problems. So, I put my foot down and refused to get supervised. Finally, my Afghan counterpart operated under the supervision of me as well as Russian surgeon.

A 6-year-old child with an apparent Wilms tumor was the next big challenge. The child's father was a senior officer in the local ministry. They were carrying an intravenous pyelogram showing a non functioning ipsilateral kidney and a normal X-ray chest. There was no hepatomegaly or any other palpable lump. They also had no other options. The child had to be managed at our facility. There were no problems in arranging blood transfusion and chemotherapy. Even radiotherapy could be arranged at the Kabul University. We reserved blood in excess of our usual requirement and went ahead. I tackled the pedicle at first instance and then went ahead with my "brutal" blunt dissection with index finger. The tumor relented in a short while. Blood transfusion was not required. Since I had not respected the tissue planes during dissections, I intended to treat it as a stage-3 tumor. The child received the chemotherapy regime that was in practice at that time. There were severe post chemotherapy side effects including gastrointestinal and hematological complications. Once I was not attending the hospital for 3 days because of fever. The child's father came to my house and appealed, "Sir! The child is going to die". He offered to drive me to the hospital in his official car. However, we were prohibited from traveling with local people for security reasons. So, I walked to the hospital (about 2 km) and sat with the child for 2 hours in the late evening. I instituted tube feeding and transfused blood that we had saved during surgery. The child recovered and went to complete chemotherapy as well as radiotherapy. They even paid a visit to me in India nearly 6 years after the surgery. The father had then became a minister in the Afghan government.

Managing esophageal atresia with tracheal fistula was tricky. Till then, local surgeons had just been doing gastrostomy and invariably children die. I wanted to do complete repair. They did not have chest retractor. The best option available was a mastoid retractor. Its sharp prongs were covered with gauze, to make it safer. I applied it after widely separating the pleura from the chest wall, thus avoiding injury to the pleura. With the help of a torch for illumination, I completed the thoracotomy repair (my first case) to my satisfaction. But postoperative management was a big problem. I requested, in vain, the authorities to provide a dedicated nurse for that child. I started tube feeding on the first postoperative day itself. Initially, I used to feed the child myself during day hours only. Then, I trained the child's grandmother to give tube feeds and supervised her during the day hours. Soon, she was confident enough to feed the child unsupervised. On the tenth postoperative day, I was elated and thought that we could start oral feeds the next morning. When I arrived at the hospital the next day, I found the child blue and

cold with severe bradycardia. The grandmother had entrusted feeding to somebody else and the child had aspirated. I could not be contacted in the night because a vehicle with permission to move in curfew was not available. It was a very huge disappointment for me. I had learnt another bitter lesson.

I was one-man army and could not rely on anyone else. I had to depend on my clinical judgment as no investigations were available except plain X-rays; even that was far from satisfactory. No monitoring was available. Once, a child with dyspnoea due to traumatic diaphragmatic hernia was admitted in the middle of night. It was rupture of the left dome of the diaphragm due to bomb blast. There was no external wound. Initially, it appeared to be a pneumothorax. But when a chest tube drained stomach contents, we knew the diagnosis. The injury was more than a month old. At laparotomy, I worked hard to mobilize stomach that was adherent to the chest wall right up to its apex. While withdrawing the stomach into abdomen, I happen to touch the heart. I was shocked to finding it stand still. I looked at the anesthetist. He was enjoying his vodka. He auscultated and told me that the child has died and removed the endotracheal tube and walked away. I was wondering as to how the child could have died as there was not much bleeding. But, maybe he was dead for a long time and corpses don't bleed! I was in tears as I closed the abdomen.

By now, I had settled down and my abilities were no longer questioned. I knew that I had to do my best and not worry too much about the results as they were influenced by many factors that were not in my control. There were no other options for those helpless patients. I had to do whatever was possible. I derived solace by the thought that surgery did exist in medieval period as well. The only way to diagnose biliary atresia was clay colored stool, jaundice and biochemical parameters. But, I look back with great satisfaction that all those children did have cholic stool after surgery.

Suboptimal results were also accepted well. Once, father of a child with bladder exstrophy lavishly complimented, "He did not have anything and you created everything". However, I was worried that the child was able to hold urine just for only one hour. There was an anorectal malformation child who kept on having problems with colostomy closure. His urethra was inadvertently transacted by an assistant. Though the operative injury was satisfactorily repaired, suprapubic cystostomy had to be done. It was too close to colostomy. So contamination could not be controlled. His father said, "It is not your fault. You cured our son; we too celebrated that and then something unexpected happened. God is not with us!" However, how could I absolve myself?

War injuries were operated round the clock. Bunches of round worms packed in the intestine was a routine finding in most of the laparotomies. I intend to de-worm them before surgery; but anthelmintics were in short supply. Round worm impaction was the most common cause of abdominal pain and intestinal obstruction. There was a child, being brought to city for intestinal obstruction. The poor child had additional bullet injury on the way to hospital. We were surprised to find whitish discharge from the wound. On opening the abdomen, we found some curd-like material in the peritoneal cavity. The bullet had hit the clump of worms and it churned them into juice. I never knew that bullets would rotate also while moving forward in linear motion. I stopped consuming curd for a while. Opening the gut and removing worms was a tedious and messy job. So, on-table, we dehydrated them with mannitol, dis-impacted and then pushed them into the colon. Later, either they themselves crawled out of the anal orifice or colonic washes were given to flush them out.

Urinary calculi were another huge problem. There were instances of recto-vesical fistula caused by erosion of vesical calculus. The indigenous practitioners would incise the posterior bladder wall

through the anterior wall of the rectum with sharp stone, and allow the stone to be passed into stool. However, many a times bladder will not close and end up in recto-vesical or recto-urethral fistula. We even treated a recto-vaginal fistula also. The poor native barber-surgeon did not realize that the vagina will come in his way!

A 10-year-old child presented with incontinence of urine which leaked continuously from supra-pubic region. I found the bladder open while the penis, urethra and pelvis were intact. I thought it to be a failed exstrophy bladder repair. However, there were no scars and no history of surgery. Bladder turn in was a relatively simple procedure and the child was fully continent after surgery.

On the day I was to fly out of Afghanistan, I was requested to operate on a child. I was told that it was farewell surgery for me. The child had four pyelolithotomies earlier and he was to be operated for the fifth time. I protested that I had to catch my flight and I was not in a right frame of mind to operate on such a complicated problem. The quick reply came was: "We have complete faith in your capability. You have handled more complex cases in more difficult situation successfully." I relented. The kidney and pelvis were densely stuck. I could expose kidney and pelvis with tiring dissection. My favorite blunt finger-dissection could not be done in this case. I opened the pelvis but I could not locate the calculus. I did not exert myself, as I thought I might damage the structures in my existing frame of mind. I requested my assistant, best surgeon in the team, to help. He had no difficulty in removing the stone. He commented, "Sir, you wanted to give me credit. The stone was right there. You intentionally did not remove it." Both of us cried on-table itself as we kissed each other goodbye as I hurried to catch my flight.

In essence, I was in a near impossible situation, not of my making. However, it was a marriage of convenience. I needed work experience and was willing to take a reasonable risk to myself and my family. Nobody else was willing to take that risk. For me it was like a swim or sink. Security issues did not allow people to move out of Afghanistan. There were tight compartments. There was only one children's hospital in Afghanistan, where they could be operated. I was practically a novice. But I had enough theoretical knowledge, which I could supplement with textbooks I was carrying. I had reasonable surgical experience also during my training at various levels. I only needed to apply it, off course without supervision.

In that era, internet was not available and there were no mobile networks. CT scan and USG had just arrived and were not widely available. Many times I had to improvise needed equipments that caused rising of eyebrows. In a case of gastroschisis, I covered the intestine with a Urobag™ (urine collecting bag) and hung it from incubator wall. I was quite pleased that the intestine was slowly making its way into the abdomen. But, someone negatively counseled the parents and they took the child away. I ended my tenure with satisfaction that I have been of some help to the helpless children.

The type of atmosphere that I have worked in the initial phase of carrier as a pediatric surgeon has molded my surgical technique. Today, even after 40 years I extensively use finger-dissection and use electrocautery occasionally. I do arrange blood as per the requirement of anesthetists, but hardly ever use it. I hardly ever ask for adjustment of table height and poor OT lights never bother me. I have performed major operations in very small hospitals. I find each of these settings, better than the place where I learned the tricks of the trade. I, once did a pull-through in a make-shift operation theatre, crafted out of a kitchen in a low-income group (LIG) flats. There was nobody to hold the retractor for want of space. The anesthetist chipped in by holding retractors from under the drapes. I always concentrate on the lesion, don't

do much of exploration and plan my surgery well in advance. So, there were not many surprises. I am always prepared for contingencies since I have thought about them in advance. That saves time as well. I am considered a fast surgeon and don't grudge about lack of facilities. Someone commented sarcastically, "If you don't give him scissors, he will cut the thread with his teeth".

Though I believe that no youngster should get into a situation, I had been. But I also believe that it is a good way of learning. After all, birds learn flying when they are unceremoniously pushed out of their nest. They are equipped with the requisites. They only need courage. I was also equipped with requisites, though I was not sure of it, and I was pushed into deep sea to either swim or sink. My destiny has always been ruthless. Now, at the fag end of my carrier, I express my gratitude to my destiny for being ruthless.

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EDITORIAL NOTE

Very little has been published about the functioning of children's hospitals at Afghanistan.[1] Similar to the author's narration, Dr. Kamran Abbasi[2] has published his Kabul experience at the Indira Gandhi Institute of Child Health, which is worth reading along with this article.

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Clinical Audit

Intestinal Duplications: Our experience and Review of Literature

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Keywords
Abdominal pain
Bowel surgery
Gastrointestinal bleeding
Intestinal Duplication
Intestinal obstruction
Mesenteric cysts

Abbreviations
CIDC - Completely isolated duplication cyst
ED - Enteric duplication
GIDC - Gastrointestinal duplication cyst
USG - Ultrasonography

Abstract

Introduction: *Gastrointestinal duplication cysts (GIDC) are rare and they occur anywhere from the oro-pharynx to the anal canal. They can be cystic or tubular and they may or may not have communication with the lumen of the adjacent bowel. Accordingly, they have varying clinical presentation. In this article we share our Indian experience with GIDC.*

Methods: *This study is a retrospective analysis of 6 cases of GIDC treated over a 3-year period (2013-16). Case records were reviewed for details of clinical presentation, nature of treatment and outcome.*

Results: *All the patients were below 6 years of age with presentations ranging from intestinal obstruction to gastrointestinal hemorrhage and pain. The male-female ratio was 5:1. One of them had a congenital isolated duplication cyst, which is very rare. The duplicated bowel was cecum in 2, jejunum in 2 and colon in 1. Pre-operative diagnosis was made in all except one patient who presented with features of intestinal obstruction. Ultrasonography and computed tomography scan were the main imaging modalities of diagnosis. They were treated by segmental resection in 3 children and cyst enucleation in 1 case. Histopathology confirmed the diagnosis. Four patients did well in the follow-up, 1 died and 1 was referred elsewhere.*

Conclusions: *GIDC commonly presented with sub-acute intestinal obstruction. With modern imaging studies, preoperative diagnosis is possible in a majority of cases. Final outcome is consistently good.*

INTRODUCTION

Gastrointestinal duplication cysts (GIDC) are rare and can involve any part of the alimentary tract, from the mouth to the anus.[1,2] They may be cystic or tubular in nature and are primarily present on the mesenteric side of the gut.[2] They are commonly seen within the first 2 years of life.[1-3] Their incidence is 1:4,500 births.[4] About 30% of all the GIDC were diagnosed in adulthood, with the majority being discovered incidentally in antenatal scans.[5,6] About 75% of GIDC are located in the abdomen, and the most common of which is ileal duplication (53%) and the least common is eso-

phageal duplications (2%). Cystic duplication of the cecum is particularly uncommon, with only 19 cases reported in the English literature.[4] GIDC may manifest as solid or cystic tumors, intestinal obstruction, perforation, gastrointestinal bleeding or intussusception. Therefore, a high index of suspicion is essential to diagnose this condition. In this report we describe our clinical experience with 6 cases of GIDC.

MATERIALS AND METHODS

This is a retrospective analysis of 6 cases of GIDC that were treated by the authors between December 2013 and December 2016. Data of all patients with respect to clinical features, radiological findings and operative findings were analyzed.

RESULTS

Details of clinical presentation, operative findings and treatment are summarized in table 1. Age at the time of presentation varied from 1 month to 6 years. Out of these, 5 were male and 1 was female. Preoperative diagnosis of enteric duplication (ED) cyst was made in five cases by ultrasonography (USG) and computed tomography (CT) scan. One case presented with gross abdominal distension, and an X-ray of the abdomen was suggestive of intestinal obstruction. USG could not detect the cecal duplication cyst due to an excessive amount of luminal gas. In 2 cases, non-communicating cystic duplication of the cecum was occluding the lumen. (Fig. 1) One case had a completely isolated, non-communicating duplication of the jejunum. (Fig. 2) This was the only child who presented with pain without any obstruction. A 6-year-old malnourished child with duplication cyst of the transverse colon presented with sub-acute intestinal obstruction. The child was very sick on admission and died of encephalitis before being considered for a surgical operation. One girl presented with intermittent gastro-intestinal bleeding and her hemoglobin was 5 g/dl. She was found to have a 100 cm long communicating tubular duplication of the terminal ileum. (Fig. 3) No action was taken at laparotomy, as resection of a long segment of ileum was ought to cause short-bowel syndrome and the expertise for doing Bianchi procedure was not available in our hospital. Hence, after correcting anemia, she was referred to an advanced center for further management. Three patients were managed by resection of the duplicated segment and enucleation of the cyst was possible in one. Postoperative recovery in all the 4 was uneventful.

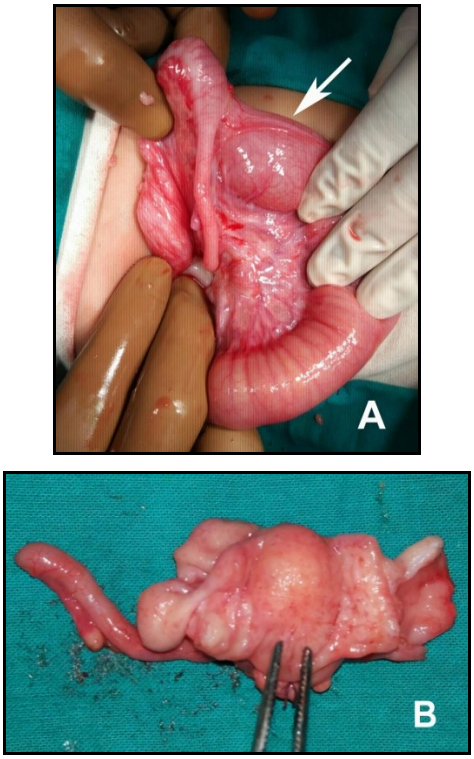
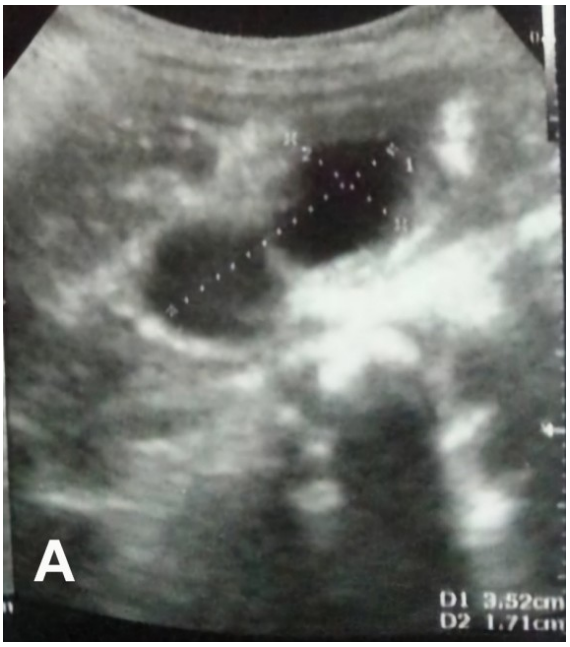
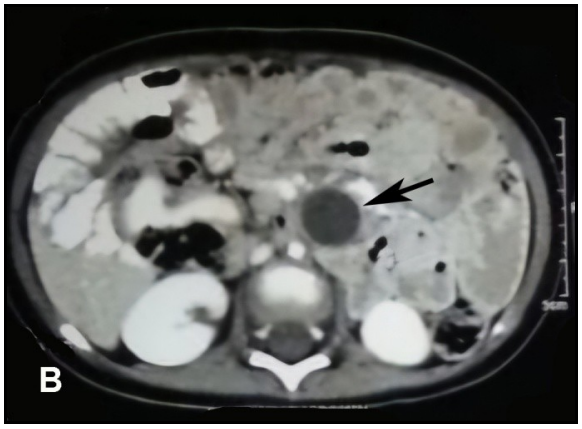


Fig 1. *Cecal duplication cyst (A) External view of the non-communicating cyst (arrow), (B) Internal view showing the luminal encroachment of the cyst*

DISCUSSION

GIDC are rare anomalies with a population incidence of 0.02%. A majority of them present during infancy.[7,8] In our study, there were two infants. Lined with intestinal mucosa, these cysts share a common wall and mesenteric blood supply with the adjacent intestine. Usually they do not communicate with the gut lumen. The term 'duplication' was popularized by William Ladd in 1930, and Robert Gross further classified it in 1950s.[9,10]





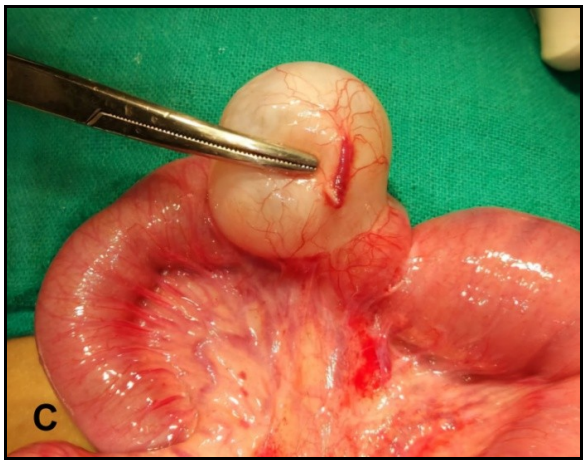


Fig 2. *Completely isolated duplication cyst of the proximal jejunum. (A) USG showing dumb-bell shaped cyst, (B) CT scan showing thick walled cyst (arrow), (C) Intraoperative photograph of the cyst*

Fig 3. *Long, tubular duplication of the ileum, extending over 100 cm in length and freely communicating with the ileal lumen*

The 3 essential diagnostic criteria of GIDC are:[11]

a) Cyst wall with well-developed smooth muscle layer
b) Mucosal lining consistent with that of adjacent intestine
c) Proximity of the cyst to the alimentary tract

The ileum is the commonest site of GIDC, followed by the colon, jejunum, stomach, and duodenum.[12] However, these cysts are rare in the cecum and esophagus.

The exact etiology of GIDC remains uncertain. One theory suggests that they are the result of defective recanalization of the intestinal lumen after the solid stage of embryological development.[13] The split notochord theory posited, neural tube traction as the cause of ED, as the latter is often associated with vertebral and spinal cord anomalies.[14]

Symptoms vary according to the size, morphology, and location of GIDC. Asymptomatic lesions are diagnosed incidentally. ED may also present with abdominal pain, distension, vomiting, constipation gastrointestinal bleeding, or intestinal obstruction.

Table 1. Clinical details of intestinal duplication in children

Pt. No	Age	Sex	Clinical Features	Location	Pathological nature	Management	Outcome
1	6 mo	M	Epigastric pain	Jejunum	NC	SRPA	Survived
2	6 yr	M	SAIO	Transverse colon	Cystic	Not operated	Died of encephalitis
3	1.5 yr	M	SAIO, Palpable lump	Jejunum	Cystic	Cyst enucleation	Survived
4	2 yr	M	SAIO	Cecum	Cystic, NC	SRPA	Survived
5	4 yr	F	Massive GI bleed	Terminal ileum	Communicating, Tubular (100 cm long)	Operation was abandoned due to technical limitations	Referred to another center
6*	1 mo	M	SAIO	Cecum	Cystic, NC	SRPA	Survived

** Investigated with only X-ray. All the other 5 patients were investigated with ultrasonography and CT scan.*

GI - Gastrointestinal, NC - Non-communicating with intestinal lumen, SAIO - Subacute intestinal obstruction, SRPA - segmental resection of bowel with primary anastomosis

There may be associated spinal and genito-urinary anomalies, although none of our cases had them. Two cases of cecal duplication presented with intestinal obstruction due to near total occlusion of the lumen, which is rare. Another case of long tubular ileal duplication presented with recurrent gastrointestinal hemorrhage. There was extensive communication with the ileal lumen. The bleeding is attributable to peptic ulcer from the presence of ectopic gastric mucosa, although this could not be confirmed histologically in our case as resection was not performed.

Ultrasound and CT scans are the primary tools of diagnosing these cysts. Sonography is especially valuable in revealing an echogenic inner margin (mucosa) and an outer hypoechoic rim (smooth muscle) - the 'muscular rim sign'.[15] Differential diagnoses include cysts of mesenteric, omental, ovarian and pancreatic origin. Segmental bowel resection is the preferred treatment of GIDC.[3]

One of our patients (case 3) had a completely isolated duplication cyst (CIDC). According to Menon a CIDC is diagnosed by the absence of any communication with the lumen of the adjacent alimentary tract, beside the typical histopathological features of a duplication cyst.[16] Only 13 cases of CIDC have been reported in the world literature.[17]

Since GIDC share a common muscle wall with the normal bowel, exclusive excision of a duplication cyst is typically not possible. The optimal procedure involves resection of the adjoining intestine along with the duplication cyst after ligating their mesenteric vascular supply. However, in one of our cases, complete enucleation of the cyst was possible as it was a CIDC.

In cases of long tubular duplications, complete excision is not advisable due to the high risk of developing short bowel syndrome. Instead, mucosal stripping by multiple incisions is recommended.[18] Untreated ED may be complicated by perforation, hemorrhage, obstruction and malignancy.

CONCLUSION

GIDC should be considered in the differential diagnosis of abdominal cystic lesions. Curative resection is possible a majority of cases. Enucleation of the cyst alone can be considered in CIDC.

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Case Report

Hair Tourniquet Syndrome of the Penis: A Case Report and Review of Literature

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Keywords
Glans amputation
Hair coil strangulation
Ischemic injury of penis
Hair thread tourniquet syndrome
Penile tourniquet syndrome

Abbreviations
HTSP - Hair tourniquet syndrome of the penis
HTTS - Hair, thread tourniquet syndrome

Abstract

Penile tourniquet syndrome caused by hair coil is often an underdiagnosed clinical entity with severe potential complications including urethro-cutaneous fistulas, necrosis of the glans and partial or complete amputation of the glans. The first reported case of this entity dates back to the early 16th century; yet surprisingly, the condition is under-recognized and is rarely mentioned in textbooks. In this report, the case of a circumcised 4-year-old boy who presented with hair tourniquet syndrome of the penis is described and a comprehensive review of the literature is discussed.

INTRODUCTION

In 1612, Guillimeau[1] first documented instances of strangulation of the glans penis due to hair strands. In his publication titled 'The Nursing of Children' he noted, "Hair, ribbon and string tied around the penis were utilized to prevent enuresis or nocturnal emission." In 1831, during the course of his clinical lecture at the St. George's Hospital, London Dr. Seymour mentioned a curious case of penile strangulation citing a report from the Rust's Magazine.[2] It was alleged that a wet nurse who was dismissed from job revengefully wound a long hair five times around and tied it to the base of the penis of a 1-month-old Jewish boy. An anonymized practitioner was said to have expressed concern that if this hair-coil had remained for a slightly longer duration, gangrene of the glans would have inevitably ensued.[2] Since then, numerous case reports and series have emerged, including 10 from India. At least 6 systematic reviews [3-9] have been published in the literature over the last 4 decades. This report describes a 4-year-old boy with partial amputation of the glans penis due to hair tourniquet syndrome and presents a comprehensive review of the relevant literature.

CASE REPORT

A 4-year-old circumcised boy presented with a penile wound and urination through the ventral surface of the penis. There was no history of fever. His parents reported that the symptoms began 3 weeks before. A general practitioner had prescribed oral and topical antibiotics, but without any relief. On physical examination the glans penis

was found to be hanging from the penile shaft on a small bridge of tissue (Fig. 1) raising the suspicion of hair tourniquet syndrome of the penis (HTSP). Surprisingly, the glans was viable. The hair coil was not visible, even under magnification. Exploration under general anesthesia revealed a sharp demarcation line with a tightly wound hair coil embedded in the coronal sulcus, resulting in near-complete transection of the urethra and corpora. (Fig. 2) He was catheterized with a 6 Fr catheter. The hair coil was cut dorsally, unwrapped and carefully removed. An end-to-end urethral anastomosis and reattachment of the severed glans to the corpora cavernosa were done (Fig. 3). Post-operatively, he developed a small urethral fistula, which is scheduled for elective repair 6 mo later.

Fig 1. *Hair-tourniquet syndrome. The deeply embedded hair coil could not be readily seen*

DISCUSSION

In 1971, Sahn coined the term 'Penis tourniquet syndrome' for hair strangulation of the penis.[10] In 1988, Barton introduced the term 'Hair, thread tourniquet syndrome' (HTTS) after reviewing 66 cases involving appendages such as fingers, toes, and external genitalia.[4]

Fig 2. *Partial amputation of the penis is intra-operatively evident after the removal of hair-coil.*

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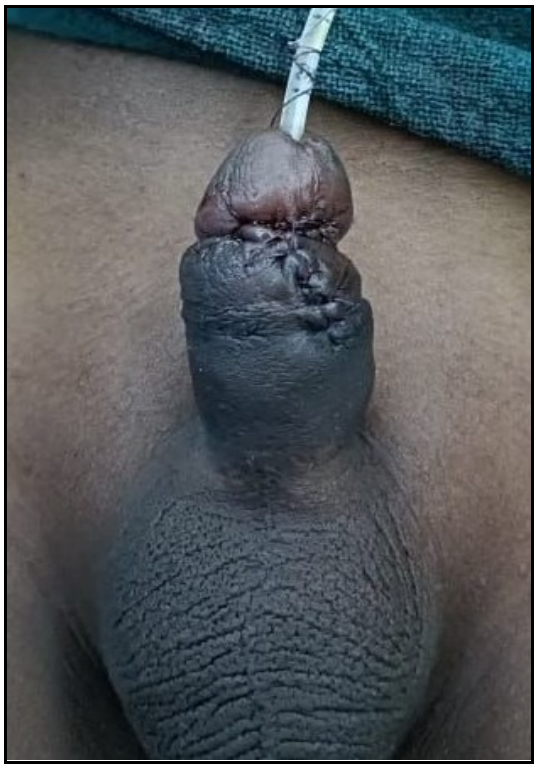

Fig 3. *Penile appearance after surgical repair*

HTTS is broad term that refers to a condition in which a strand of hair, thread or fiber encircles an appendage, leading to ischemic strangulation and even necrosis. In an extensive review and meta-analysis[6] of 210 cases, the affected body parts include the penis (44%), toe (40%), finger (9%), and other sites (7%). In penile HTTS, hair was the offender in 91 out of the 93 cases and this is specifically called as HTSP. HTTS has also been reported to affect several other organs including the clitoris, vulva, mons pubis, tongue, uvula, neck, earlobe, umbilicus and nipple.[9]

HTSP is a rare condition, with approximately 200 cases been documented worldwide till date. It is a serious condition that is characterized by a hair strand encircling the coronal sulcus of the penis, leading to various complications such as glanular edema, necrosis, urethral fistula, urethral transection and partial or complete auto-amputation of the glans penis.[6,9] Additionally, dorsal neurovascular injury has been reported, resulting in anesthesia of the glans penis.[11] About 90% of HTSP is found to occur in circumcised boys.[8]

HTSP may be accidental or intentional.[2, 7] While it may be a simple accident in many boys, Acimi identified several predisposing factors such as poor personal hygiene, a moist environment associated with nocturnal enuresis, presence of pubic hair in young children and a coronal sulcus that is not covered by the foreskin as it is in circumcised boy.[12] Telogen effluvium, an excessive shedding of hair experienced by postpartum mothers due to hormonal changes, has also been implicated.[9]

Some authors believe that HTSP is a common form of child abuse, a cause overlooked for decades. It should be considered in cases where caregivers try to prevent enuresis.[5] Haddad had compiled a lengthy list of motivations behind this form of child abuse, some of which are quite bizarre.[3]

The grading system representing the severity of HTSP developed by Bashir and El-Barbary[13] has been widespread acceptance. (Table 1) Our index case, reported here, belongs to Grade III.

Table 1. Bashir-El Barbary Grading of HTSP

Grade	Description
I	Skin constriction without urethral injury (mild case)
II	Partial division of corpus spongiosum with urethral-cutaneous fistula
III	Complete division of the corpus spongiosum and constriction of the corpus cavernosum (partial amputation)
IV	Gangrene, necrosis, and complete amputation of the glans.

HTSP - Hair tourniquet syndrome of the penis

The treatment of HTSP primarily involves decompression of the strangulated tissues by completely releasing the constricting hair as soon as possible following the diagnosis. This can be done by either non-surgical or surgical methods, the choice being dictated by the depth, nature and visibility of the constricting hair. A depilatory cream with thioglycolate base is a highly effective and painless technique suitable for superficially located and visible band of hair.[14] Surgical exploration under general anesthesia is the preferred method for deeply embedded constrictors or when edema is obscuring the visibility of hair strand. Genital reconstruction is indicated by the nature of the injury.[9] Both one-stage and two-stage repairs of the glans and urethra have been described.[6,11]

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Case Report

Delayed Presentation of a Bleeding Renal Artery Pseudo-aneurysm in Pediatric Blunt Trauma

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Keywords
Angio-embolization
Blunt abdominal injury
Hematuria
Pediatric trauma
Pseudoaneurysm
Renal injury
Vascular pathology

Abbreviations
CECT - *Contrast enhanced computed tomography*

Abstract

Renal artery pseudo-aneurysm following trauma is rare in children. Bleeding pseudo-aneurysm requires high index of suspicion for early diagnosis and proper management. This report describes a 10-year-old boy who presented with delayed bleeding from a renal artery pseudo-aneurysm following a motor vehicle accident. Contrast enhanced computed tomography scan showed a bleeding pseudo-aneurysm in the upper pole lobar artery of the left kidney. Angio-embolization of the pseudo-aneurysm was successfully done using pushable coil. Post-embolization recovery was marked by temporary minimal abdominal pain and hematuria that resolved without any residual renal dysfunction. Awareness of this rare condition is crucial for early detection and successful management.

INTRODUCTION

Renal artery pseudo-aneurysm is a known complication of penetrating or blunt injury and renal interventions.(1) It is less common following blunt abdominal trauma and is even rarer among the pediatric population. Clinical diagnosis of a bleeding pseudo-aneurysm requires high index of suspicion because of its rarity and unpredictable clinical presentation. Prompt recognition and intervention of this potentially fatal sequel of abdominal trauma is essential to prevent mortality and morbidity.

CASE REPORT

A 10-year-old boy was brought to the emergency department following a high-impact road traffic accident. He presented with vomiting, abdominal pain and hematuria; but he was hemodynamically stable. Contrast enhanced computed tomography scan (CECT) showed Grade-III renal and Grade-III splenic injuries as defined by the Organ Injury Scaling Committee of the American Association for Surgery of Trauma (AAST). He was managed non-operatively. He had few episodes of fever that was assumed to be due to nosocomial infection and empirically treated with antibiotics. However, a septic work-up was negative. He was observed for

a week as an in-patient and was discharged after the resolution of symptoms.

One month later, he presented again with gross hematuria, suprapubic pain and difficulty in micturition. On examination, he was pale with notable gross hematuria, passing out blood clots. (Fig. 1) Digital rectal examination was unremarkable. His hemoglobin was 7.1 g/dl, requiring transfusion of packed cells. An ultrasonography of the abdomen showed blood clots in the urinary bladder with no other significant abnormality.

Fig 1. *Clinical presentation of renal artery pseudo-aneurysm with gross hematuria with passing out of blood clots*

He continued to have gross hematuria. Though he was hemodynamically stable his dropping hemoglobin level necessitated further transfusion. A repeat CECT showed a lobulated lesion within the lacerated left kidney that enhanced with contrast during the arterial phase. The lesion was measuring 1.3 x 1.5 cm. A bleeding pseudo-aneurysm of the upper pole lobar artery was diagnosed.(Fig. 2)

Trans-femoral angiography showed a contrast filled sac arising from the left renal artery.(Fig. 3) Angio-embolization of the pseudo-aneurysm was successfully done using a pushable coil. Post-embolization imaging confirmed complete resolution of the pseudo-aneurysm.(Fig. 4)

During the post-embolization period he had transient abdominal pain (managed with analgesics) and self-limiting mild hematuria. There were no evidences of residual renal dysfunction and he was discharged after 48 hr of observation. At one month follow-up he was well and a Doppler ultrasonography was normal.

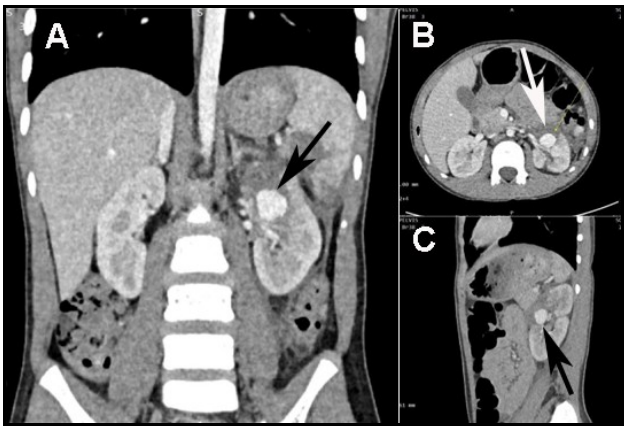

Fig 2. *Arterial phase contrast enhanced computed tomography demonstrating the contrast enhancing lobulated lesion in the upper pole of the lacerated left kidney suggestive of a bleeding pseudo-aneurysm (arrows). (A) Coronal view; (B) Axial view; (C) Sagittal view.*

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Fig 3. *Pre-embolization angiography demonstrating the pseudo-aneurysm arising from the left lobar renal artery (arrow)*

Fig 4. *Post-embolization angiography demonstrating the disappearance of pseudo-aneurysm*

DISCUSSION

Non-surgical management of blunt renal injury in hemodynamic stable children is a widely accepted method with good outcomes. Nonetheless, renal artery pseudo-aneurysm may complicate blunt abdominal injuries.[1] There are only six cases of pseudo-aneurysm reported in children after blunt injury,[1–5] with the age ranging between 6-17 yr. The commonest presentation is gross hematuria following trauma or a renal procedure. The time interval between trauma and hematuria can be highly variable, ranging from 1 day to 38 years.[1,6] While flank pain is commonly reported in the literature, our patient had suprapubic pain due to acute urinary retention secondary to blood clots in the bladder. Given the variability of clinical presentations, high index of suspicion is essential to diagnose this uncommon cause of hematuria.

Doppler ultrasonography is the choice of first-line investigation of post-traumatic hematuria as it is non-invasive, radiation-free, easily available and cost effective. But, lesion location and operator expertise may limit its diagnostic value.[7] Pseudo-aneurysms may be missed if they are not clinically suspected. Bi-directional flow at the neck of the aneurysm showing a 'ying-yang' color pattern is characteristic of pseudo-aneurysm in the Doppler scan. CECT provides more useful information, such as the location of the lesion and its relation with the parent vessel. However, high radiation dosage limits its liberal use in children. Angiography, though invasive, is the gold standard of diagnosis with therapeutic extension.[8] Radiation dosage of renal artery embolization as measured by Dose Conversion Coefficient is approximately 0.26 ($mSv/Gy{\cdot}cm^2$) which is higher than all other diagnostic methods. Radiation dose of fluoroscopy guided interventions are of special concern, as children are more radiosensitive than adults.[9]

Out of the 6 reported cases of renal artery pseudo-aneurysm in children, only 1 was managed surgically with excision of the pseudo-aneurysm and primary anastomosis of the renal artery.[2] The remaining five were managed successfully with angio-embolization.[1,3–5] Among the 5 cases, only one patient had low grade fever, nausea, vomiting and left flank pain suggestive of post-infarction syndrome.[5] Post-embolization syndrome, though a serious complication, is fortunately rare, occurring in only 2.6% of patients.[10] Advancements in imaging modality enable super selective embolization with improved outcome.

More recently, covered stents have been described for post-traumatic renal artery pseudo-aneurysm with improved success rates.[11] Deployment of the covered stent excludes the pseudo-aneurysm from circulation, theoretically offering a nephron-preserving endovascular approach with minimal risk of post-infarction syndrome. However, this technique has only been described in adults and its pediatric application is yet to be studied.

Renal artery pseudo-aneurysm may result in significant morbidity and mortality if it is not promptly diagnosed and treated. The increasing popularity

of non-operative approach in blunt abdominal injury has led to an increase in the reporting of this previously rare complication. Therefore, it is imperative that pediatric surgeons be aware of this rare post-traumatic complication, which may present after several months or years. Despite newer endovascular methods, angio-embolization remains the recommended therapeutic approach with good outcome in the pediatric population, averting the need of surgery.

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Case Report

Anti-Reflux Valve Procedure in Recurrent Ascending Cholangitis Following Kasai Portoenterostomy

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Keywords
Anti-reflux valve
Ascending cholangitis
Biliary Atresia
Kasai portoenterostomy

Abbreviations
AC - Ascending cholangitis
ARV - Anti-reflux valve
BA - Biliary atresia
KPE - Kasai portoenterostomy

Abstract

Ascending cholangitis (AC) is the commonest and most serious complication following Kasai portoenterostomy (KPE) that significantly affects the long-term outcome of biliary atresia (BA). The role of anti-reflux valve (ARV) construction in preventing bile reflux into the Roux limb thereby reducing the risk of AC is debated in the literature. In this report we describe two infants who experienced AC within 1 month of KPE for BA. Blood cultures grew multi-drug-resistant organisms and imaging studies revealed bile lake formation. Both underwent the ARV construction to address persistent AC. One patient showed significant clinical improvement with no further episodes of AC over a year, while the other child rapidly deteriorated with the disease progressing to liver failure and death. While adjunctive therapies like ursodeoxycholic acid and prophylactic antibiotics are beneficial, ARV appears to be a promising option in reducing bile reflux and recurrent AC, thus prolonging the longevity of the native liver in BA.

INTRODUCTION

Ascending cholangitis (AC) is the commonest complication following Kasai portoenterostomy (KPE). It has profound impact on the prognosis of biliary atresia (BA).[1,2,3] Recently, liver transplantation has emerged as the definitive treatment for BA. However, it is not available in several centers due to numerous challenges.[4] This underscores the continuing importance of KPE in the era of transplantation and the need of developing strategies to mitigate complications such as AC and to preserve the native liver function for as long as possible.[5,6]

Construction of an anti-reflux valve (ARV) is said to prevent the recurrence of AC by reducing bile reflux into the Roux limb. Thus, it has the potential to improve the long-term outcome, to enhance the quality of life and to delay the need for liver transplantation.[7,8,9] Literature on the effectiveness of ARV is contradictory.[8-11] In this report, we share our experience with 2 infants who underwent ARV procedure as secondary intervention of multiple episodes of AC following KPE.

CASE REPORTS

Case 1

A term baby-boy, presented with prolonged conjugated hyper-bilirubinemia, pale stool and sonographic features suggestive of BA. On day-77 he underwent on-table cholangiography and KPE. He achieved jaundice clearance within 3 months of KPE (lowest serum total bilirubin 29.4 µmol/l). However, he developed 3 episodes of AC within a span of 4 months. Hence, ARV procedure was done 6 months after KPE. (Fig. 1) However, following the procedure, he rapidly deteriorated with onset of end-stage liver failure and succumbed to the disease a month later.

Case 2

A term baby-girl, presented with prolonged conjugated hyper-bilirubinemia, pale stools and ultrasonographic features of BA. On the day-85 of life intra-operative cholangiography confirmed type-3 BA and KPE was done. The lowest serum bilirubin level post-KPE was 118 µmol/l. She developed 3 episodes of AC within 4 months, for which ARV procedure was performed after 4 months of KPE. Following the ARV procedure, her clinical status improved significantly. There were no further episode of AC and her total bilirubin levels showed a consistent decline, reaching a nadir of 37.4 µmol/l one year after KPE.

DISCUSSION

AC is the most prevalent and early complication of KPE.[1] Recurrent episodes of AC significantly increase the risk of liver fibrosis and cirrhosis, contributing to poor long-term outcome in BA.[2] Early identification and timely surgical management of associated complications, such as the bile lakes, are crucial to preserve the native liver function and to delay the disease progression.[3]

Although KPE is not now considered curative of BA, it serves as a vital bridging procedure that delays the need for liver transplantation especially in country with scarcity of donor liver.[7] Consequently, optimizing KPE and additional interventions, such as the ARV procedure, becomes important to prolong the survival of the native liver and, to improve growth and nutrition while awaiting for eventual transplantation.

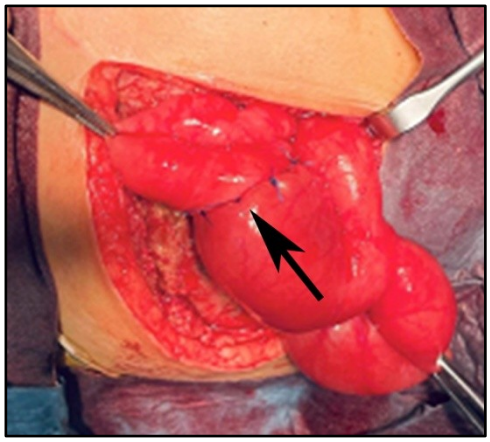

Fig 1. *Construction of anti-reflux valve (arrow) in the Roux limb of portoenterostomy*

ARV provides a relatively simple surgical solution for recurrent AC. Various types of artificial ARV include mucosal, conical, telescoping intestinal, and muscular valves.[8] In our patients we employed conical valve technique. A one-way valve was constructed by intussuscepting a 3 cm segment of the Roux limb cranio-caudally near the previous jejuno-jejunostomy to prevent refluxing of the small bowel contents into the Roux limb. Non-absorbable monofilament sutures were used to secure the valve and its patency was tested. Case-1 highlights the severity of advanced liver disease, where even the ARV procedure failed to halt the onset of liver failure. Conversely, the successful clinical course of Case-2 underscores the potential benefits of ARV in mitigating recurrent AC and maintaining stable liver function.

Studies on the effectiveness of ARV are scanty reporting variable outcomes.[8-11] Nakajo performed ARV procedure on 23 patients, including those without AC.[8] Among those with recurrent AC, 3

had complete resolution, 2 had reduced episodes and 1 died from persistent AC. Similarly, Saeki who studied ARV 20 infants, reported 1 death due to bile excretion failure and 1 case of recurrent AC but with fewer episodes.[9] The long-term outcome of ARV in human infants is unknown. However, Nakajo suggested that atrophy or disappearance of the valve is unlikely due to its multilayered structure.[8] In a postmortem examination Saeki reported of an ARV that maintained its structure and anti-reflux function for at least 2 years and 3 months.[9]

CONCLUSION

ARV appears to be a promising surgical option in the management of recurrent AC in BA. Further studies are warranted to evaluate the durability of the constructed ARV.

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Association News

First Anniversary Symposium of the PST

Inaugural ceremony of PST aniversary. From left to right: Drs. Theranirajan (Dean, MMC), Vivek Gharpure (Editor), Lakshmi (Director, ICH) and Venkatesh (Resident Medical Officer, ICH)

The first anniversary of the *Pediatric Surgery in Tropics* (PST) was celebrated on the 25 January 2025 at the Institute of Child Health (ICH), Madras Medical College (MMC), Chennai, India. Marking the celebration, a one-day dual mode (online cum physical) *Tropical Pediatric Surgery Symposium* was organized by Prof. Velmurugan, with the help of Drs. Rohit Gopinath, Krishnakumar Govindarajan and Aravindh Radhakrishnan. About 130 delegates participated in the event. The Tamilnadu Medical Council recognized the event by granting one credit-hour. Anniversary issue of the journal was released by Prof. Theranirajan, (Dean, MMC) and was received by Prof. N. Prasad, (Senior Pediatric Surgeon).

The topics of deliberations included Hydatid cysts by Vijay Kundal (Jammu, India), Pouch colon by Praveen Mathur (Jaipur, India), Airway foreign bodies by Sarabon Tahura (Dhaka, Bangladesh), Hyperinsulinemic hypoglycemia by Velmurugan (Chennai, India), Disorders of sex development by Nabila Baila Talat (Lahore, Pakistan), Solid tumors in retroviral-positive children by Milind Chitnis (East London, South Africa) and Green initiatives by Narasimhan Kannan (Singapore). The event was partly supported by the donations of Shaahid Scans (Chidambaram, India).

Release of the first anniversary issue of the PST. From the left to right: Profs. Lakshmi (Director, ICH), Theranirajan (Dean, MMC), Velmurugan (Head of Pediatric Surgery, ICH), Prasad (Senior Pediatric Surgeon) and Kavitha (Vice-principal)

Guests and delegates of the PST Anniversary Symposium 2025

Rapporteur: ***Raveenthiran Venkatachalam***

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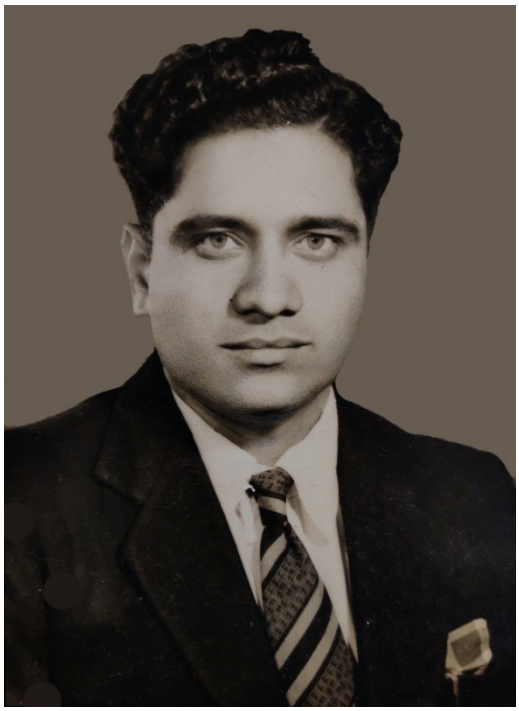
Association News

Gharpure Memorial Foundation Supports PST



Prof. Vishwanath Ganesh Gharpure

Born 7 Jul 1926 **Died 18 Nov 1984**

Vishwanath Ganesh Gharpure was an illustrious professor of surgery at the Government Medical Colleges of Nagpur, Aurangabad and Mumbai. He was the first batch of graduates from the Government Medical College, Nagpur and obtained post-graduate training in general surgery from the same institute. He also had special training in neurosurgery from the Christian Medical College, Vellore. He was a visiting professor to the University of Chicago during 1963-64.

VG Gharpure Memorial Foundation was started by his children with an aim to support academic activities in field of surgery. The foundation annually sponsors an oration in the Marathwada Surgical Conference and awards prizes for the best post-graduate theses in surgery.

The VG Gharpure Memorial Foundation has kindly come forward to partly support the publication of the *Pediatric Surgery in Tropics* journal through a generous donation. The editors and the board members of the PST thankfully acknowledge this noble gesture.

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